

WHAT IS CLAIMED IS:

1. A coating film forming apparatus for forming a coating film by applying a coating solution to a substrate comprising:

5 a cassette mounting section on which a substrate cassette housing a plurality of substrates is mounted;

 a coating unit for applying the coating solution to the substrate taken out of the substrate cassette which is mounted on said cassette mounting section;

10 plural treatment units for performing at least either pre-treatment or post-treatment for treatment of applying the coating solution; and

 a main transfer mechanism for transferring the substrate between said coating unit and said treatment units,

15 wherein said coating unit has (a) a coating section including a substrate holding portion for holding the substrate, a coating solution nozzle for discharging the coating solution to the substrate, provided to be opposed to the substrate held by the substrate holding portion, and a drive mechanism for moving the coating solution nozzle relatively to the substrate along a surface thereof while discharging the coating solution to the surface of the substrate from
20 the coating solution nozzle, and (b) a reduced-pressure drying section for drying under a reduced-pressure atmosphere the substrate which is applied with the
25

coating solution in the coating section.

2. The apparatus according to claim 1,
wherein said coating unit is provided with
an auxiliary transfer mechanism for transferring the
5 substrate between the substrate holding portion and the
reduced-pressure drying section.

3. The apparatus according to claim 1,
wherein said coating unit is provided with a
coating film removing section for removing the coating
10 film at a peripheral portion of the substrate which is
dried under reduced pressure in the reduced-pressure
drying section.

4. The apparatus according to claim 3,
wherein said coating unit is provided with an
15 auxiliary transfer mechanism for transferring the
substrate between the substrate holding portion, the
reduced-pressure drying section, and the coating film
removing section.

5. The apparatus according to claim 1,
20 wherein the reduced-pressure drying section has
a mounting portion for placing the substrate thereon,
a closed container for making an atmosphere in which
the substrate is placed on the mounting portion a
closed atmosphere, and pressure reducing means for
25 reducing pressure inside the closed container.

6. The apparatus according to claim 5,
wherein the closed container is divided into

an upper side portion and a lower side portion, and the upper side portion and the lower side portion are provided to detachably join with each other.

5 7. The apparatus according to claim 6,
 wherein the mounting portion in the reduced-pressure drying section is used also as the substrate holding portion in the coating section.

 8. The apparatus according to claim 3,
 wherein the coating film removing section is
10 provided with a substrate holding portion for holding the substrate, a surrounding member having a C-shape cross section so as to sandwich the peripheral portion of the substrate held by the substrate holding portion, a solvent nozzle provided to be opposed to the surface
15 of the substrate in the surrounding member, and suction means for sucking an atmosphere surrounded by the surrounding member.

 9. The apparatus according to claim 3,
 wherein the substrate holding portion in the
20 coating film removing section is structured so as to be rotatable.

 10. The apparatus according to claim 9,
 further comprising a detecting portion for
 optically detecting the peripheral portion of the
25 substrate held by the substrate holding portion in the coating film removing section, the substrate holding portion being rotated so that the substrate is oriented

in a predetermined direction based on a result of
a detection by the detecting portion.

11. The apparatus according to claim 8,
wherein reception and delivery of the substrate
5 from/to said main transfer mechanism in said coating
unit are performed via substrate holding portion in the
coating film removing section.

12. The apparatus according to claim 1,
wherein application is performed while the coating
10 solution is discharged in a line shape having a fine
diameter from the coating solution nozzle.

13. The apparatus according to claim 1,
further comprising a mask for covering portions
except for a region of coating film formation on the
15 substrate and receiving the coating solution from the
coating solution nozzle.

14. A coating film forming apparatus for forming
a coating film by applying a coating solution to
a substrate comprising:

20 a cassette mounting section on which a substrate
cassette housing a plurality of substrates is mounted;

a coating unit for applying the coating solution
to the substrate taken out of the substrate cassette
which is mounted on said cassette mounting section;

25 plural treatment units for performing at least
either pre-treatment or post-treatment for treatment of
applying the coating solution;

a reduced-pressure drying unit for drying under a reduced-pressure atmosphere the substrate which is applied with the coating solution in said coating unit, provided as one of said plural treatment units; and

5 a main transfer mechanism for transferring the substrate between said coating unit and said treatment units,

wherein said coating unit has a substrate holding portion for holding the substrate, a coating solution
10 nozzle for discharging the coating solution to the substrate, provided to be opposed to the substrate held by the substrate holding portion, and a drive mechanism for moving the coating solution nozzle relatively to the substrate along a surface thereof while discharging
15 the coating solution to the surface of the substrate from the coating solution nozzle, and said main transfer mechanism has a holding member for holding the substrate and atmosphere forming means for making an atmosphere in which the substrate is held by the
20 holding member an atmosphere in which vaporization of solvent is inhibited.

15. The apparatus according to claim 14,

wherein the atmosphere forming means is means for supplying solvent vapor.

25 16. The apparatus according to claim 14,

wherein the atmosphere forming means is means for making the atmosphere at least either an atmosphere

at a predetermined temperature or an atmosphere at
a predetermined humidity.

17. The apparatus according to claim 14,
wherein said main transfer mechanism has washing
5 means for washing the holding member.

18. The apparatus according to claim 17,
wherein said washing means has means for supplying
a washing solution to the holding member and means for
supplying gas for drying to the holding member.

10 19. The apparatus according to claim 14,
wherein said main transfer mechanism has detecting
means for detecting a stain of the holding member.

20. The apparatus according to claim 14,
wherein said main transfer mechanism has a cover
15 body for surrounding a circumference of the substrate
held by the holding member.

21. The apparatus according to claim 14,
further comprising a coating film removing unit
for removing the coating film at a peripheral portion
20 of the substrate which is dried under reduced pressure
in said reduced-pressure drying unit, provided as one
of said plural treatment units.

22. The apparatus according to claim 14,
wherein application is performed while the coating
25 solution is discharged in a line shape having a fine
diameter from the coating solution nozzle.

23. The apparatus according to claim 14,

further comprising a mask for covering portions except for a region of coating film formation on the substrate and receiving the coating solution from the coating solution nozzle.

5 24. A coating unit for forming a coating film on a substrate by supplying a coating solution to the substrate from coating solution discharge means comprising:

 a container for housing the substrate therein;
10 solvent-atmosphere generating means for supplying solvent vapor of the coating solution to the inside of said container to generate a solvent atmosphere at a predetermined concentration inside said container;

 intake means for sucking the atmosphere inside
15 said container;

 a sensor for detecting a concentration of the solvent atmosphere inside said container; and

 control means for controlling operation of said solvent-atmosphere generating means and operation of
20 said intake means based on the concentration detected by said sensor.

 25. The coating unit according to claim 24,

 wherein said solvent-atmosphere generating means has a tank for storing the solvent therein and a
25 heating mechanism for heating the solvent in the tank, and heating by the heating mechanism is controlled by said control means.

26. The coating unit according to claim 24,

5 further comprising a cover for opening and closing
a carrier inlet/outlet of said container, the cover
being formed with a slit through which said coating
solution supply means is movable, an intake port being
arranged in the vicinity of the slit.

27. The coating unit according to claim 24,

wherein said intake means has an intake port
formed on said container.